

SINTA[®] M2219 Synthetic Fibers

Synthetic Micro Fiber for reinforcement of concrete (formerly Grace Microfiber™)

Product Description

SINTA[®] M2219 is a synthetic fiber for concrete, manufactured from 100% virgin polypropylene in a micro-monofilament form. SINTA[®] M2219 is produced on a state-of-the-art production line which is specifically designed to yield an ultrathin concrete reinforcing fiber able to achieve superior performance at a lower dosage rate compared to conventional monofilament fibers. SINTA[®] M2219 contains over 70 million individual fibers for each 1.0 lb/yd³ dosed. Engineered specifically for use in concrete, they are alkali resistant, non-absorptive and completely non-corrosive. SINTA[®] M2219 protects concrete from stresses which cause cracking while the concrete is most vulnerable during the first 24 hours after placement. SINTA[®] M2219 complies with ASTM Designation C1116, Standard Specification for Fiber-Reinforced Concrete and Shotcrete, Type III Synthetic Fiber-Reinforced Concrete or Shotcrete. SINTA[®] M2219 is available in 0.75 in. (19 mm) length.

Compliance and Certification

- ASTM C1116 / C1116M, Standard Specification for Fiber-Reinforced Concrete, Type III Synthetic Fiber-Reinforced Concrete
- Meets ICC ES AC32 criteria for Plastic Shrinkage Crack Reduction

Product Advantages

SINTA[®] M2219 uniformly distributes multi-dimensionally through-out the concrete mixture. The extremely high number of fibers in the fresh concrete matrix protects the concrete when its tensile strength is lowest, reducing the formation of plastic shrinkage cracking. The reinforcement reduces the formation of all types of early age cracking. This cracking caused by plastic shrinkage, settlement and other internal stresses would otherwise permanently weaken the resultant concrete. This cracking and other internal stresses would otherwise permanently weaken the resulting concrete. The concrete permeability is decreased, while surface characteristics, impact and toughness properties are improved.

When tested in accordance with ICC ES AC32 criteria for plastic shrinkage crack reduction, SINTA[®] M2219 fibers provided a 78% reduction in plastic shrinkage cracking over a control sample when dosed at 0.5 pcy.

Technically advanced production techniques make SINTA[®] M2219 a highly durable fiber that is virtually invisible in fresh concrete. This minimizes fiber-reinforced concrete finishing concerns while providing the highest level of crack protection available.

- Protects concrete when tensile strength is at its lowest, reducing the formation of plastic shrinkage cracking.
- Enhances impact and toughness properties.
- Easy to mix and fast to disperse.
- Minimizes fiber-reinforced concrete finishing concerns.

- Reduces plastic shrinkage cracking and improves durability.
- Protects concrete from stresses that cause cracking.
- Provides cost effective control of plastic shrinkage.
- Provides overall higher quality of concrete.

Uses

SINTA[®] M2219 may be used as an alternative to light-gage welded-wire reinforcement in applications where decreased plastic shrinkage cracking and improved durability are desired.

Specifically, such applications include but are not limited to, slabs on grade, pavements, overlays, sloped walls, pools, shotcrete, stucco, precast and prestressed products. It is suggested that this product be used in conjunction with properly compacted base materials and jointing in accordance with ACI guidelines and standards.

Addition Rates

SINTA[®] M2219 may be added to concrete at any point during the batching or mixing process. SINTA[®] M2219 may be added to the aggregate during weighing or charging, or to the central mixer or truck before, during, or after charging. The concrete must be mixed at high speed for 5 minutes, or 70 revolutions, after the addition of SINTA[®] M2219 to ensure uniform distribution. The standard range of addition for SINTA[®] M2219 is 0.5 to 1.0 lb/yd³ (300 to 600 g/m³) of concrete. ASTM C1579 testing has shown that 0.5 lb/yd³ (300 g/m³) is most efficient, providing greater than 77% crack reduction when compared to the control specimen.

Compatibility with Other Admixtures

SINTA[®] M2219 is compatible with all GCP admixtures. Its action in concrete is purely mechanical and will not affect the hydration process. Each admixture should be added separately.

SINTA[®] M2219 Physical Properties

Specific gravity	0.91
Absorption	None
Modulus of elasticity	500 ksi (3.45 GPa)
Tensile Strength	42 ksi (290 MPa)
Melt point	320 °F (160 °C)
Ignition point	1094 °F (590 °C)
Alkali, acid and salt resistance	High
Material	100% virgin polypropylene
Nominal Length	0.75 in. (19 mm)
Nominal Fiber Count	70 million per lb.

Specifications

Fibers shall be 0.75 in. (19 mm) micro-monofilament polypropylene fibers as supplied by GCP Applied Technologies, 62 Whittemore Ave., Cambridge, MA 02140. One pound (450 grams) of fibers shall contain no less than 70 million individual fibers, 0.5 lb (225 grams) of fibers shall contain no less than 35 million individual fibers. Required dosage rate shall be as specified by the design engineer or architect. SINTA[®] M2219 shall be used in strict accordance with the supplier's recommendations and within time as specified in ASTM C94. The fiber shall comply with ASTM Designation C1116 Type III. Standard ACI 302 procedures for placing, finishing and curing shall be followed when using SINTA[®] M2219.

Packaging

SINTA[®] M2219 is available in convenient Concrete-Ready[®] Bags which are added, unopened, to the truck drum or central mixer. The specially designed cellulose fiber bags disintegrate and disperse the fibers throughout the mix. SINTA[®] M2219 is available in 0.5 lb and 1.0 lb Concrete-Ready[™] Bags in the U.S. and 600 g Concrete-Ready[™] Bags in Canada.

Safety and Handling

Read and understand the product label and Safety Data Sheet (SDS). All users should acquaint themselves with this information prior to working with the products and follow the precautionary statements. SDSs can be obtained by contacting your local GCP representative or office.

References

Building Codes

BOCA National Building Codes, SBCCI Standard Building Code, ICBO Uniform Building Code and all supplements as adopted by the Council of American Building Officials.

American Concrete Institute (ACI)

ACI 544.1 R State of the Art Report of Fiber-Reinforced Concrete

ACI 302 Guide for Concrete Floor and Slab Construction

American Society of Testing and Materials (ASTM)—

ASTM C1116 Standard Specification for Fiber-Reinforced Concrete and Shotcrete.

ASTM C1579 Standard Test Method for Evaluating Plastic Shrinkage Cracking of Restrained Fiber Reinforced Concrete (Using a Steel Form Insert).

ASTM C94 Standard Specification for Ready-Mixed Concrete.

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Last Updated: 2022-04-27

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